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Increase of Railroad Post Routes.

The Postmaster General's recent Report gives us a good idea of the rapid increase of railroads in our country, which is an index of its rising greatness, facilities for travel, rapid conveyance of merchandize and news, and the enterprise of our citizens. It says:—

"On the first of July, 1842, the total length of railroad route was 3,191 miles. On the first day of July, 1852, the number of miles on which the mail was conveyed on railroad, amounted to 10,146, making an increase of 7,055 miles in ten years Between the first of July, 1852, and the first of July, 1856, the railroad sercice was increased 10,177 miles, exhibiting the fact that within that time this description of service has been more than doubled.

The table below shows the length of railroad routes and cost of mail service thereon, at the end of each fiscal year from 1852 to 1856, inclusive:

Year.	Miles.	Cost.
1852	10,146	$1,275,520
1853	12,415	1,601,329
1854	14,650	1,786,453
1855	18,333	2,073,098
1856	20,323	2,310,389

On the first of December, 1856, the railroad service had increased to 21,310 miles, and the total cost for this service at that date amounted to $2,403,747."

Oregon Fruit.

Oregon must be a great country for fruit, according to our cotemporary and exchange, the Oregon *Times*, published at Portland, in that territory. It says:—

"The size, quality, and quantity of apples raised here from young trees, challenges competition, and justly excites the wonder of all. It is estimated that not less than $75,000 worth of apples will be shipped to California this season. The last steamer took away some two thousand bushels, we learn.

The size of our apples is almost incredible. We saw a bushel of pippins at Pritchard's the other day, whose average weight was eighteen ounces each. From one small tree he has gathered six bushels of Tolpy Hockings. Quinces and pears also grow in abundance.

Almost every farmer has an orchard growing, and from the yield of the young trees we cannot resist the conclusion that Oregon is destined to become the most celebrated portion of the Union for fruit. It is no uncommon thing to see specimen apples weighing from one and a half to two pounds."

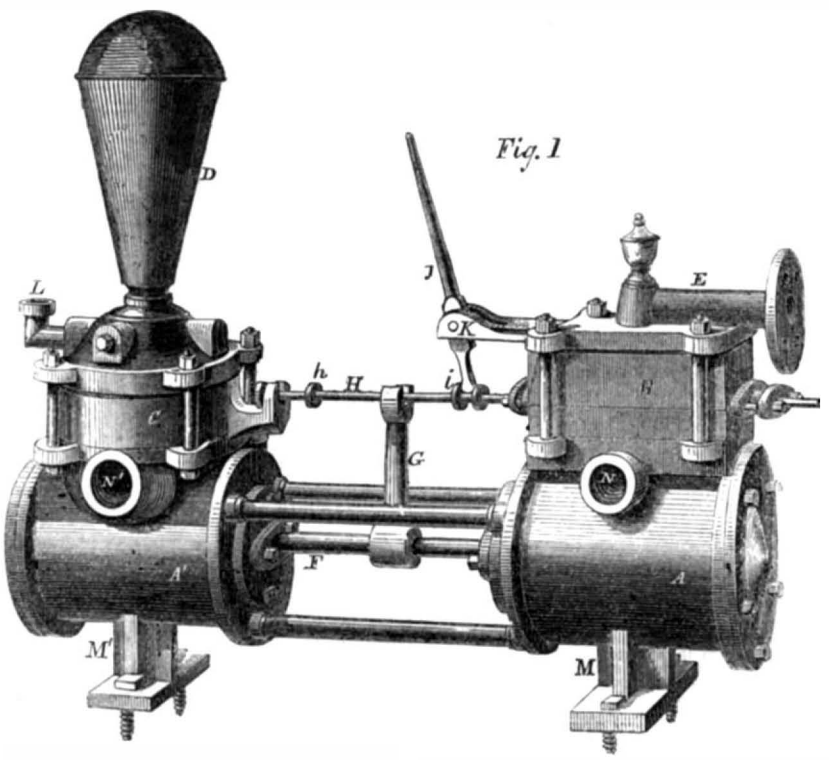
A Dangerous Cosmetic.

The use of belladonna, we have seen advertised to give brilliancy and fascination to the eye. This is a dangerous drug to use for this purpose. It is true that it gives to the eye an extraordinary brilliant appearance by contracting the *iris*, and enlarging the pupil; but this tends to weaken and destroy the delicately beautiful action of the organ of sight.

Russian Squirrel Trade.

In 1842 1,460,000 squirrel skins were exported from Russia to China in exchange for tea. Most of these skins came from Siberia, and were the quarry of the exiles' traps.

IMPROVED STEAM PUMP.



Improved Steam Pump.

The accompanying figures represent the improved Direct-Acting Steam Pump of Messrs. Guild & Garrison, of Williamsburgh, N. Y., for which a re-issued patent was granted July 29th, 1856.

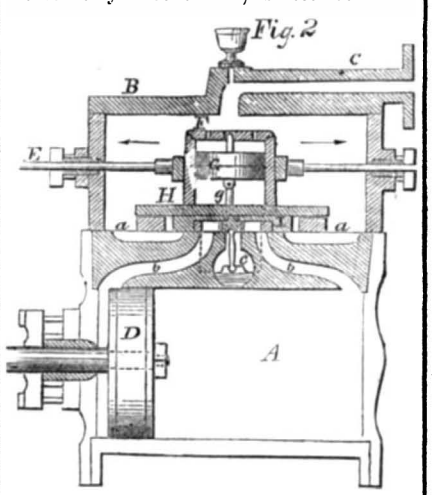
Figure 1 is a perspective view of the steam engine and the pump. A is the direct-acting steam engine and all its parts. A is the pump and its parts, which are operated by the steam engine. B is the steam chest or valve box; C the valve box of the pump, and D the air chamber. F is the piston rod, G the valve shipper, H the valve rod, and *h* the tappet, which the shipper strikes while moving in one direction, and I is the tappet crotch, which it strikes while moving in the other direction. J is the valve rod lever, with its lower end in the crotch; K is its fulcrum. E is the inlet steam pipe, and N the exhaust. N' is the suction passage of the pump, and L its discharge pipe. M M are flanges to bolt the cylinder to sleepers.

Figure2 is a vertical section taken through the steam valve chest and cylinder. A is the cylinder, B the steam chest, C the inlet steam pipe, D the piston, E the valve rod, F a small cylinder in the valve chest, which has a small piston, G, in it, having a jointed arm, *g*, in it, extending down within the exhaust cavity of the valve seat, and rocks on an arbor or shaft therein. The piston, G, is fitted steam tight in its small cylinder, and the pressure of the steam comes upon its top surface. There is a plate or valve driver, to which the small cylinder is attached; it laps around the valve ends leaving a small space between them. I is a chambered slide valve, and *a a* are cavities in the face of the valve seat, and by the valve connect with the ports that lead to the cylinder, A. The valve driver plate is placed between a valve at each side, hooking around their ends with the small space between them, as shown, for lead; it does not lie nor press on the top of the valves.

When the valve is moved to the one side, the steam passes from one of the cavities in the seat under its end into one of its chambers, thence into the cylinder by one of the passages, *b b*; the steam is then exhausting from the under end of the large piston, D, through the other chamber of valve I, and out through the passage, *c*.

When the piston, D, of the engine arrives near the end of its stroke, and the shipper arm strikes one of the tappets on the valve rod, it causes the valve driver plate to slide a short distance before moving it; but when its hook at the end has come in contact with the end of the valve, I, to commence moving it on its seat, the arm, *g*, of the small piston, G, (fig 2,) passes its line of culmination, and the pressure of the steam which is always acting on the small piston, G, to force it towards the valve, causes the arm, *g*, then to be thrown suddenly over, giving the small piston its cylinder, and the valve driving plate, a quick movement to reverse the position of the valve. The small piston in the cylinder relieves the valve driver of such pressure of the steam as is due to its area.

The principle of the invention embraced in this improved steam pump, consists is giving to the valve in the steam chest the whole or part of the movement necessary to effect the change in the direction of the movement of the engine piston by means of the steam acting upon the small piston, G, (fig. 2) in the small cylinder in the steam chest, throwing the valve by a rocker arm, as described.



In a direct-acting steam engine it is necessary that the valve should have a throw given to it at the dead points. The means of accomplishing this object in this steam pump are very ingenious and simple. A number of ways of applying the driver without balancing the valve may be carried out. Two short slide valves of the common form, each working over one steam port and one exhaust port are used, these valves being connected at their sides by narrow strips, H, between which the driver—consisting of a flat plate with a cylinder like the above—works directly on the valve seat. The rock arm, *g*, and its rocker shaft will be arranged to work in a cavity in the valve seat. The valve driver may also be arranged to work in a seat at one side of the valve seat; or for long strokes with a valve at each end and the driver between them. There is no waste of steam or power in working the valves of this pump.

Quite a number of these steam pumps are now in successful use, and they have acquired an excellent reputation for boiler feeders for sugar refineries, draining quarries, mines, &c. it is also an excellent fire pump for factories on ships, and every purpose, in fact, for which a compact, strong, simple, cheap, and convenient double-acting steam pump is required, also as a vacuum or air pump.

These pumps are manufactured at the works of the Company at Williamsburgh, N. Y.—More information may be obtained respecting them by letter or otherwise addressed to Guild, Garrison & Co., No. 301 Pearl st., New York City.

One of these pumps can be seen in operation at James O. Morse & Co.'s, No. 79 John street, this city.

A Reported Great Lake in Africa Nowhere

The *Westminster Review* for October notices "Explorations and Discoveries during four years' wanderings in the wilds of Southwestern Africa, by C. J. Anderson," from which we extract this paragraph:—

"C. J. Anderson has put an end to a lie which was beginning to gain credence among us. African missionaries, penetrating some distance inwards from the southwestern side of the continent, recently brought information—which they received second-hand from Arab travelers—of a vast fresh water lake far in the interior, described as being of enormous dimensions—as nothing less than a great inland sea. Frequenters of the Geographical Society's meetings at Whitehall have observed, in consequence, on the site which used to be marked in the maps as a sandy desert, a blue spot, about the size of the Caspian, in the shape of a hideous inflated leech. We trusted that a more accurate survey would correct the extreme frightfulness of the supposed form. Mr. Anderson, however, has spared us further excitement. The lake turns out to be a mirage—a mythus with the smallest conceivable nucleus of fact. On the very spot occupied by this great blue leech—long. E. from Greenwich 22, lat. 20 21—he found a small speck of bitter water (not fresh) something more than twenty miles across, of the size of Lough Corrib, in Galway. So perishes a phantom which has excited London geographers for a whole season."

Paint Poison.

A correspondent of the Paris Academy of Sciences, states that the poisonous properties of lead paint are due to the turpentine which is mixed with it, not the lead. This opinion is antagonistic to the commonly received one It may be correct, however, in this way: the turpentine is volatile, hence it may lift some of the lead when evaporating, and thus the metal be inhaled by the painter, in the form of mineral gas. He asserts that if turpentine were not used, paint-poison would be unknown.

Gold in a Brickyard.

By the recent news from California it is stated that at San Andreas, during a rain, it was discovered that some brick in a brickyard contained gold, and it being found that the gold was more valuable than the brick, the proprietors had turned a stream of water on it, and were washing away the whole brickyard.

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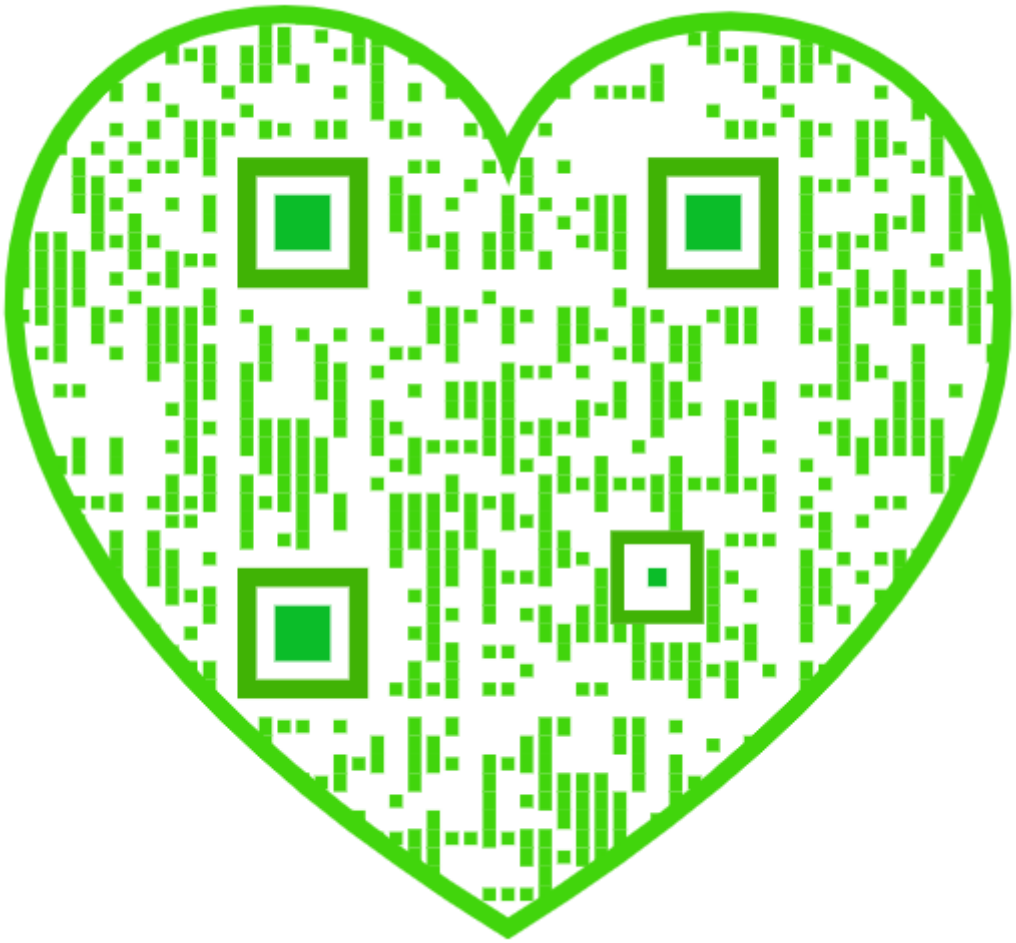

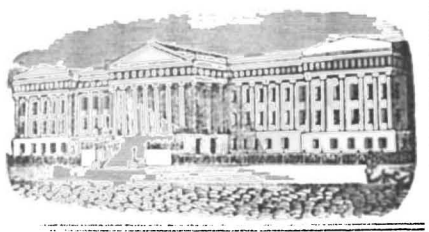

Advice to American Patentees Concerning Foreign Patents.

It is generally much better to apply for foreign patents simultaneously with the application here. If this cannot be conveniently done, as little time as possible should be lost after the patent is issued, as the laws in some foreign countries allow patents to any one who first makes the application, and in this way many inventors are deprived of their right to take patents for their own inventions.

Many valuable inventions are yearly introduced into Europe from the United States,—by parties ever on the alert to pick up whatever they can lay their hands upon which may seem useful.

It is a part of our business to secure European patents —in fact three-fourths, and probably more, of all the patents granted in Europe to American citizens, are solicited through this office. We have faithful agents in the chief cities in Great Brita n and on the Continent, and through them we can not only solicit patents, but often effect their sale upon advantageous terms. We can give the names of many of our patrons who have realized fortunes out of their European patents through our Agents abroad, if it is desired

We are prepared at all times to furnish advice in regard to Foreign Patents, and will cheerfully do so on application personally at our office or by letter.

Models are not required in any European country, but the utmost care and experience is necessary in the preparation of the case.

Almost every invention that is of value in this country is of equal value abroad, and we would recommend patentees to pay more attention to securing their inventions in foreign countries than they have heretofore done.

All particulars in regard to the modus operandi of obtaining patents in any country where patent laws exist, may be had by addressing the publishers of this paper.

MUNN & CO.,
128 Fulton street, New York.

(Reported Officially for the Scientific American.

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING DECEMBER 2, 1856.

ICE SAW—Stephen Scotton, of Richmond, Indiana: I claim, first, the saw, o, operated or rotated as shown, and placed in the swinging frame, which is rendered adjustable by means of the rack, Q, pinion, i, and notched wheel, k, as described, for the purpose set forth.

Second, I claim moving the platform, A, and feeding the saw, O, to its work, by means of the wheels, H I, on the driving shaft, C, the pinion, f, and screw, h, on the shaft, J, and the toothed wheel, I, on the axle, B, as shown and described.

Third, I c aim moving the platform, A, laterally, when necessary, by means of the wheels, S S, on the shaft, R, and the wheel, O, on the plate, T, these parts being arranged as described.

[In this ice sawing machine a circular saw is employ ed and placed in an adjustable swinging frame. The arbor of the saw is connected with a proper feed motion to propel the carriage to which the saw is attached, and this carriage is provided with a device to adjust it for sawing blocks of ice of any required width. This ice machine saws ice with great rapidity, is not complicated, nor liable to get out of order.]

AXLE BOX—Wm. H. Saunders, of Hastings, N. Y.: I claim a lining of a thin tube of condensed and hardened ductile metal or composition, substantially such as specified introduced and secured within the box, and presenting a hard, polished surface to the axle itself, substantially in the manner and for the purposes described.

SYPHON A CLAPIT—Henry M. Walker, of Watertown, Conn.: I am aware that syphons have been filled at the top, and that a valve, or stop-cock, has been used on the long arm.

But I claim the application of a device for the simultaneous opening and closing of the orifices, at each end of a syphon.

CONVERTING ROTARY INTO RECIPROCATING MOTION —Albin Warth, of New York City: I claim the intermittent, semi-rotating head, F, or its equivalent, carrying in eccentric relationship to the bearing of said head, a driving pinion, H, for gearing with the endless rack, D, and driven by or operating through suitable gear, a pinion, f, arranged with separate action, concentric to said head—the latter being combined with sliding stops, j j, or their equivalents—all arranged and operating together, substantially as and for the purposes set forth.

[Various devices have been employed for converting reciprocating into rotary motion, and vice versa. This improvement embraces a very simple method of obtaining these results. It is applicable to and useful for various machines, being preferable for some purposes, either to a crank or eccentric.]

SELF-ACTING RAKES FOR HARVESTERS—Jesse Whitehead, of Manchester, Va.: I claim the combination of the rakes, I J, rod F, when said parts are made to operate together, and independently of each other, substantially as described.

I also claim, in combination with the rakes, and rod, F, the permanent cam, R, and yielding cam, S, which causes said rakes to advance in one line, and return in another line, as set forth.

I also claim, in combination with the rake head, H, the rod, g, having its support alternately in Q h, for the purpose of preventing said rake head from binding on its ways, as set forth.

And, finally, I claim giving the rake, I a movement varying to the size of each and every gavel, as set forth.

RAKING APPARATUS—S R. Hunter, of Cortlandt, N Y.: I do not claim the rotating cutters, C C, and the hinged or jointed plates, A A, for they have been previously used, and were formerly patented by me.

But I claim the bar, J, attached or hinged to the arm, K, on the platform, H, and operated by the spring, L, chain j, ball k, which is fitted in the box M, and the plate I n, the wheel, G, when the parts are arranged to operate in combination with rotary cutters, C C, and endless apron, I, as described, for the purpose set forth.

[This is an improvement in rotary cutting harvesters, a patent having been previously granted on this class of reapers to Mr. Hunter. The endless apron and raking attachment as now combined with the rotary cutters in this machine, render it exceedingly simple in construction: and it is said to operate well.]

MOP HEADS—Frederic Allen, af Worcester, Mass.: I do not claim a clamp, formed of two bars hinged together t one end of each, and provided at their opposite ends, with a screw, for forcing one of them towards the other.

I claim my spring clamp mop head, as made of a bar of spring steel, as stated, bent and formed with an eye and a hook at its opposite ends, as explained, and having a link applied thereto, so as to operate therewith, as specified.

FEEDING PAPER TO PRINTING PRESSES—Moses S. Beach, of Brooklyn, N. Y.: I do not claim the printing of sheets on both sides, at one operation.

But I claim seizing the back or tail end of the sheet, and thus returning it to the types, for a second impression, in the manner substantially as set forth.

EARTHEN VESSELS FOR HERMETICALLY SEALING—Edwin Bennett, of Baltimore, Md.: I am fully aware that rims, ridges, grooves, or gutters, and also ground surfaces, have been employed; and also, that in some kinds of jars or vessels, formed from plastic material, the lower surface of the lid, and the upper surface of the vessel, or jar, have been left unglazed; and, consequently, I dis claim all such.

I claim, in the manufacture of earthen vessels, constructing the covers or lids of such vessels, with the beveled or sloping edge, d d, and plane surfaces, e e, unglazed, or in the biscuit state, when said lid or cover is used, in combination with a vessel, the contiguous surfaces, b b c c, of which are also left unglazed, and in an absorbent state, for the purpose set forth.

WRISTBAND FASTENER—J. P. Derby, of Boston, Mass. I claim arranging and combining with a face plate, in manner substantially as described, two parallel cross pieces, B and C, one of which, the lower or second cross-piece, being constructed with a movable section, D.

I claim the hollow stem, E, through which the post passes, that is connected with the movable section of the cross piece.

I also claim the arrangement of the lever, H, in connection with the face plate, and the movable section, D, of the cross-piece, whereby, by turning the face plate the desired motion is given to the cross piece or wing; the whole making an effective fastener, for the purposes described.

BACKING ELECTROTYPE PLATES—Wm. Filmer & Edward Bookhout, of New York City: We claim, first, the box or hopper, B, placed in an inclined position, and the plate, C, placed within the box or hopper, the bottom, b, of the box or hopper, being provided with ledges, d d e, and arranged as shown.

Second, we claim the spiral springs, W, interposed between the shell, E, and plate, C, as described.

[Melted metal has previously been poured in between two plates to form the backs of electrotype shells which were placed between the plates, but perfect backs were never formed in this manner. This improvement avoids every difficulty, and at the same time, by the employment of springs in the hopper, the shell is kept in proper position, and allowed to expand uniformly at all points, when heated by the molten metal, so that it will not warp. The electrotype shells can be backed expeditiously and of a uniform thickness.]

NUT MACHINES—Robt. Griffiths, of Philadelphia, Pa. I claim, first, the manner, substantially as set forth, of securing the punching and cutting bars between the sliding plates, for the purpose specified.

Second, the combining of the punching and cutting bars, with the strippers, the said strippers being whole, or divided, and operating in either of the methods specified.

OVENS—J. P. Hayes, of Philadelphia, Pa.: I claim, making an oblong opening, g through the plate, f, which is fixed to the back of each of the ovens, substantially and for the purpose set forth and described.

Second, I claim the arrangement of the soot catching trough, h, at the back part of each of the said ovens, substantially as and for the purpose set forth.

ROCK DRILLING—Mastin Gore & Jno. P. Gore, of St. Louis, Mo.: We do not claim feeding the drill at the end, or during its down stroke, by the action of its head on the device holding its suspending mechanism; another operation being required, for turning the drill, as such constitutes no part of our invention.

We claim the combination of the rock shaft and its arms, O P Q, with the pawls, S T, ratchets, V U, and the collar, N, on the drill shaft, for effecting the feed and turning of the drill, by the upward movement of its shaft, as set forth.

R. R. CHAIRS—J. H. Morley, of St. Louis, Mo.: I claim fishing the joint of railroad bars, with a divided chair, to ease the grip of the chair to the rail, on the bottom flange of the rails, when so constructed, that the divided bed of the chair shall not come into contact with, or impinge upon each other, so as to bear any part of the strain of a weight upon the rails, but leave the upper jaws free to bite with the whole strain of the bolts, whereby they are made to gripe the rail joints more firmly, as the cars move over them, without the necessity of being supported upon ties or bearers, as heretofore, in the manner substantialty as described.

PENTAGRAPHS—Henry Neumeyer, of Macungie, Pa.: I claim the upper sliding frame, A A A A, in combination with the under stationary frame and casing, B B B C C, and the traversing cog racks E E, and uprights, F, the slotted traversing bed plate, D D g g H H, with the traversing drawing board, or tablet. D2, the compound cog and geared cone pulleys, L L M M2 O O2 O7, the compound or double and adjustable rack devices, P P P2 P3 P4 Q Q Q, as described.

I also claim the grooved sliding rack bar, R2 R2, of the traversing rack, S S, with its devices, S2 T2, when combined with their pinions and cone pulleys, and the traveling carriage. A A, as described.

DRYING CYLINDERS—Horace W. Peaslee, of Malden Bridge, N Y.: I claim the employment of a spiral tubular heater, upon a non-conducting cylinder, in combination with an exterior metallic casing, as set forth.

BABY WALKER AND JUMPER—E. Y. Robbins, of Cincinnati, O.: I claim the arrangement of the upper extension of the broad-based caster-supported frame of the apparatus around and over the head of the child, coming in contact with articles of furniture, as he moves himself over the floor, and forming a support for the jumper (or child sustaining canvas-covered hook,) and also serving the purpose of suspending toys above the head of the child, and within his reach, to amuse him, and at the same time cause him to judiciously exercise his arms and chest, substantially as set forth.

EXPANDING TAP—Harley Stone, of Uxbridge, Mass., & M. D. Cole, of Blackstone, Mass.: We do not claim making expanding tools, by means of cam surfaces, irrespective of form and arrangement.

But we claim the arrangement of the cam piece, J, the nut, I, and screw, G, and their conneciton with the cutters and case, A, when constructed and operating as set forth.

APPLYING STEAM TO AND UTTING SCARFS FROM WOOD—Job White, of Belfast, Me.: I do not claim the discovery or invention of the cutting a board from the circular surface of a log by means of a circular or revolving disk with cutters moving laterally; that was patented by me and Phineas P. Quimby, Sept. 12th, 1827. That machine never was able to work with any degree of facility or success, and remained my exclusive property.

Nor do I claim that steaming wood for the purpose of working it is an invention.

But I claim, first, the arrangement of the cams and beam in combination with the feeding gear, by which the perpendicular and rotary motion of the log is made immediately after the cutter has passed through, giving exact feed to continue a circular kerf around the diminishing surface of the log, making a board of uniform thickness.

Second, the mode and arrangement by which I apply steam or heat to a log, in the process of being sawed, by which I am able to apply it to the surface of the log immediately before the cutters, and at the particular time and place required for the work designed; the same result may be obtained by a cast-iron hollow form, by which either steam or heat may be applied to the surface of the log.

WRENCHES—Orin O. Witherell, of New York City: I claim attaching the fixed jaw, B, of the wrench to a handle, which has its extremity made eccentric, by a fulcrum pin, D, and arranging the movable jaw relatively to said end of the handle, and to the fixed jaw, substantially as and for the purpose set forth.

[By simply pressing against the handle of this wrench in one direction the movable jaw is firmly clamped in its place, and by simply pressing against the handle in the opposite direction, the jaw is set free, and readily adjusted to operate on nuts of any size. It has a spring and lever for keeping the movable jaw in place, and preventing it from shifting while being adjusted. This wrench is very convenient for use, and we regard it a useful improvement.]

CLAMPING CUTTERS—J. P. Grosvenor, of Lowell, Mass.: I claim connecting the collars with each other, or with the core blocks, by means of tongues and grooves, in the manner substantially as described, for the purpose set forth.

R. R. CAR SEATS AND COUCHES—Theodore T. Woodruff, of Alton, Ill.: I claim the combination of the movable and fixed frames on one side of each compartment with the movable and fixed frames on the opposite side thereof, to form each of two depressed couches when unfolded and connected, and which may be converted into two opposite seats when the two movable seats are thrown up and over the permanent frames, substantially as described.

I also claim combining each of the hinged folding backs on one side of each compartment, with each of the corresponding hinged backs on the opposite side of the same compartment, by means of the folding or connecting frames, or equivalent therefor, substantially as described, whereby the same may be used as backs for the seats, or as couches, as set forth.

And finally, I claim forming an elevated couch above the windows by the combination of the two sets of hinged frames, substantially as described, so that when not required to be used as a couch, the two sets of frames may be folded up out of the way, in the manner substantially as described.

R. R. CAR SEATS AND COUCHES—Theodore T. Woodruff, of Alton, Ill.: I claim in combination with the movable frame, g, and the fixed frame, f, substantially as described, the employment of the movable seats at the ends of the several divisions, substantially as described, to give the required number of seats when the couches are not used for the purpose of reclining, as set forth.

I also claim converting the back of the side seats into an elevated couch, as set forth, by connecting the upper or back edge of said back to the side of the car, or to the partitions, e e, by hinged joints or other equivalent means, and holding it up in the required elevated position by means of catches, or other equivalent means, as described, in combination with the movable frame, g, and fixed frame, f, or any equivalent therefor, as described.

I also claim the manner of connecting the upper or fourth couch with the car, substantially as described, so that it may be let down, to be used as a couch, or thrown up to the roof of the car when not required to be used, as set forth.

And, finally, I claim in combination with the said upper or fourth couch, the hinged or suspended step, substantially as described, for the double purpose of a step to give access to the said upper couch, when used as such, and as a means of securing said couch when thrown up out of the way, as set forth.

VAULT COVERS—Thomas Floyd, (assignor to himself and George H. Merklin,) of Chambersburg, Pa.: I claim the guides, D, working in grooves, e, in coubination with cross bar, f, spring, h, and rod, g, for the purpose of elevating the cover, as described.

I also claim guides, D, in combination with catches or bolts, d, and springs, b, for fastening the cover down, as described.

GRINDING PAPER STOCK—Vespasian O. Balcom, of Bedford, Mass., and Charles H. Hill, of Billerica, Mass.: We claim the revolving pulp tub, E, or its mechanical equivalent, in combination with the grooved grinding roller, G, revolved thereon, at a greater or different speed than this tub.

Also the combination of the revolving pulp tub, E, and friction or evening roller, J, arranged and operated essentially in the manner and for the purpose set forth.

BRAMAH PLANING WHEEL—Edwin Jones, of Greenfield, Mass.: I claim providing the planing wheel with knives for edging or jointing the articles, when arranged as a single instrument, and operating substantially in the manner and for the purpose specified.

COVERING THREAD WITH WOOL—Andrew L. Fuller, of Clinton, Mass.: I do not claim the weaving of quilted, wadded, or padded goods, nor the use of wadding in the loom.

Neither do I claim making the sliver of two materials in order to spin a finer round a coarser, or vice versa, as I am aware that is old.

But I claim the described mode of placing the core in the sliver, and covering it by the combined action of the comb, B, and condenser, C, so as to produce the sliver above described, and this I claim whether a twist be given to the sliver or not.

STEERING APPARATUS FOR SHIPS—David W. Smith, of Boston, Mass.: I claim the arrangement of the guard rack and the pinion on the tiller with the main rack, and the pinion of the hand wheel shaft, the whole being substantially in the manner and for the purposes as specified.

CASTING METALLIC TUBES—James Smith Jr., of Norton, Mass.: I claim the method of making the metallic mold core, viz., of removable separate sections or staves, c d, and a narrow trapezoidal or wedge-shaped spring or stave, e, the whole being arranged and held together by rings, g g, and plugs, or their mechanical equivalents, and made to operate in the manner substantially as specified.

HAND STAMP—Nathan Ames, of Saugus, Mass., (assignor to the Boston Hand Stamp Company, of Boston, Mass.: I do not claim, in this machine, the principle by which the inking roller, K, is made to pass over the bottom and back of the type block, B, that being embraced in a patent granted to me April 1st, 1856.

But I claim, in combination with the other parts of any stamp to be held in the hand, the leg or wire, D D, so constructed as to strike the article to be printed in advance of the type block, B, and thereby cause the inking roller, as described, to pass over the printing surface while the latter is descending.

I do not confine myself to any particular manner, as there may be many in which the leg, B D, may be made to communicate motion to the inking roller. But I claim the leg, D D, both independently of the inking apparatus, and also combined with it and the other parts of the stamp, in any manner substantially the same as that described.

DESIGN.

PRINTING TYPES—George Bruce, of New York City I call this new type Double Small Pica Copperplate Script.

Loss of Silver in Roasting Silver Ores.

Professor Plattner, of Germany, in an article in the *Berg-undhattenman Zeitung* points out the serious loss of silver in roasting silver ores, to which we would direct the attention of all our silver mineralogists :—

"It has been long known from experience that during the roasting of silver ores and furnace products in a finely divided state, in addition to the mechanical loss of silver through the formation of fine dust, there also occurs a loss by direct volatilization, varying, according to the properties of the ore, from 1 to 10 per cent., and in argentiferous blende, exposed for a long time to a strong calcining heat, amounting to much more. These facts give rise to a question which may be divided into two parts, namely :—1st, How does it happen that in ores containing an equal per centage of silver, but of different qualities and composition, the loss per cent. in silver differs when they are subjected to the process of roasting? And, 2ndly, In what condition is the silver volatized?

To solve the first part of this question many experiments were made, on a small scale, by Prof. Plattner, in the following manner :—Various substances, for the most part quite free from silver, were reduced to a fine powder, and mixed with other substances rich in silver, and also in fine powder, in such proportion that the mixture should contain from 1 to 2 per cent. of silver; these were then exposed to the action of heat and atmospheric air, in capsules of clay. For this purpose a muffle was used, heated to dull redness, and most of its openings closed so as to allow of a very moderate circulation of air within it. The heat was gradually raised until it reached a temperature at which sulphate of copper is slowly decomposed. The substances used to mix with those rich in silver were pyrites, blende, various anhydrous metallic sulphates and metallic oxyds, and finely powdered quartz; those rich in silver were sulphuret of silver, metallic silver, arseniate and antimoniate of silver, all in fine powder. These substances were roasted from three-quarters of an hour to an hour and a half, and then assayed for silver in the usual way.

The results of these experiments showed a loss of silver was occasioned by chemical causes. That a volatilization of silver appeared to take place when the silver in the ore either passed from the state of sulphuret into that of metal, or when the oxyd of silver in combination with sulphuric acid, again suffered decomposition.

The loss appeared to be greatest in light loosely aggregated substances, whose particles had little cohesion, and were readily penetrated by the atmospheric air. The loss of silver was greater when the roasting was protracted, if at the same time the temperature was increased.

That the loss was increased when magnetic oxyd of iron or suboxyd of copper exercised a reducing action on sulphate of silver.

That generally the loss of silver was greater when the silver existing as sulphate was exposed to a protracted roasting at a high temperature in company with free metallic oxyds than when it was present as arseniate or antimoniate of silver. The reason of this is, that the sulphate of silver is decomposed and reduced to metallic silver before either of the other salts, and more particularly before the arseniate, although their behavior at a high temperature is not altogether the same as the antimoniate of silver is very rapidly decomposed, the other two salts more slowly."

To determine the second question he endeavored to volatilize silver by passing a current of hydrogen over it when at a red heat, but no volatilization took place, but with a current of oxygen gas it was oxydized. From the results of his experiments, the conclusion is drawn that the silver which escapes during the roasting is removed at a certain temperature commencing at a low red heat, and mixes with the combustion of the fuel and other gases, and is carried off by them.

Peculiar Characteristics of Meteoric Stones.

There is one character which is peculiar in the meteoric stone, and which proves to be of high significance, viz :—Its substance is composed of various mineral ingredients, which are identified with matters of familiar occurrence upon the earth; but amidst these iron is found in great abundance as it is never found on the earth, that is, in a native or nearly pure metallic and uncombined state. On the terrestrial surface iron is always mingled with diverse matters, from which it has to be extracted by art when it is required as a pure metal. The omnipresent and corrosive oxygen of the air alone prevents it from maintaining such condition long; this rusts and eats it away. Oxygen and iron have so irresistibly strong an attachment for each other that they invariably combine when they are left together. Thus, then, the unoxydized and purely metallic condition of iron in the ærolite proves that it comes from a situation in which there is no oxygen; that is, from beyond the bounds of the atmosphere, and that it is, therefore, altogether unterrestrial, and affords proof that the nebular hypothesis is not supported by chemistry, for if the moon at one period formed part of the same matter of which the earth is composed, it would have an atmosphere like the earth, but not quite so dense.

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Motion of the Moon.

[We have concluded to admit the following letter on this subject, for the reasons given below.]

MESSRS. EDITORS—It is somewhat surprising that men of science should enter into a discussion in regard to whether or not the moon rotates on its axis. The controversy is in character similar to that which was carried on by Descartes and others, as to what was the measure of force—a dispute about the definition of terms. All astronomers know precisely what kind of a motion the moon has; and the controversy is only what this motion shall be termed—whether it is a revolution around the earth and a rotation on its axis, or simply a revolution around the earth with the same side constantly towards it. We have many similar motions, both in and out of nature. The balls of the governor revolve round a center with the same side continually towards the center of motion. Any ball on the surface of the earth does the same; and in fact each particle of matter composing any body in rotary motion revolves around the center of motion with the same particular side towards the center.

If we consider the motion of the moon as relates to the earth, we see it always presenting the same side towards us, and of course, as relates to the earth, it has no apparent rotation on its axis. But viewed astronomically, as a body moving in space, we see it revolving around the sun once a year, in a path slightly serpentine, always concave to the sun, however, only varying the 1-400th part of its distance from the sun from a true elipsis. And during this revolution it presents its different parts to the sun thirteen times. Thus, as relates to the sun, it rotates on its axis.

But it is said the question can only be determined by a model. How so? Models are only for illustration to those who do not understand the thing represented. And do not all astronomers know as well what kind of motion the moon has, as they would after seeing a model? Would not the question still arise, as to what the motion should be called?

A model was made some century ago by that ingenious mechanician and astronomer, James Ferguson. He made many machines to illustrate the motions of the heavenly bodies, and amongst the number one which he called the *Trajectorium Lunare*, for determining the paths of the earth and moon, showing what kinds of curves they make in the ethereal regions. And he concludes a description of it by saying, "This is an occular proof of the moon's turning round her axis."

The time of scientific men might be much more profitably employed than in disputing about what a well-known motion of one of the heavenly bodies shall be called.

J. B. CONGER.

Jackson, Tenn., 1856.

[It is but little to the credit of men of science to dispute about mere terms, but the recent controversy about the moon's rotation in England, is not in relation to what terms shall be used to express a certain motion of the moon, but whether the moon has such a motion. Men who really comprehend a subject should be able to write clearly upon it, but this is not always the case. The majority of men have not the faculty of clearly conveying, by language, the views which they entertain on subjects, hence, by the very terms they use, they confuse others and oftentimes confound themselves. There has been no controversy regarding the moon's revolution round the earth in twenty-eight days, and always presenting the same face to the earth. The boor who believes the moon is "no larger than his grandsire's shield," can be made to understand and believe this in a few minutes' conversation. But here, during the whole year 1856, there has been a controversy going on in the London scientific journals, whether the moon has a relative motion on its own axis in 28 days, conjointly with a revolution around the earth in the same period. In this controversy some of the most scientific men in England have engaged—such as Dr. Lardner, Prof. Whewell, Evan Hopkins, Mr. Simonds, and others. If these men have been disputing about mere terms—what a thing shall be called—they certainly have displayed an immense amount of stupidity in expressing their opinions.

The motion of the moon has been compared to that of the governor of a steam engine, but the comparison is only correct in one particular, namely: the ball of the governor and the moon always present the same face to the point or body around which they revolve. The governor is connected by an arm to an axis or spindle, and it revolves around its axis in the same period of time in which this axis or spindle rotates; but the earth around which the moon revolves, has no 28 days' rotation, it rotates on an axis of its own every 24 hours. Comparisons, to be really useful, must be correct.

During the period in which the moon is revolving around the earth, it must present all its sides to the inhabitants (if there are any) of the planets, as clearly set forth by Mr. Conger. A locomotive driving wheel, in moving around a curve, revolves *with* its axis; a cart wheel, in performing the same operation, would revolve *on* its axis—the one is loose, the other fast, but they both show a varying phase to the center of the curve, around which they revolve. They always show the same side to the center of the curve, but not the same phase; the crank pin of the driver on the locomotive is seen above, below, and at each side of the axis during its revolution. If the wheel of the locomotive (or that of the cart) be chained and made to slide along the curve, it will present the same phase to the center during its entire revolution. It has but one motion— that of revolution. Is this the motion which the moon has around the earth? Hopkins, Simonds, and others contend that it is—or else they write so confusedly as to make others believe they do. Whewell, Lardner, and others, contend that it has an independent motion on its axis, besides its revolutionary motion. This question has nothing to do with the conjoint motion of the moon with the earth around the sun.

We have received a great number of communications on this subject from old and esteemed correspondents, but have always refused to publish them, because they presented nothing different from what has been published in the controversial articles in the London papers. The above letter is different from all we have yet received on the subject: it charges foreign scientific men with a warfare about mere *terms*. We therefore advise those English (and some German) Dons of Science, who are still slashing away at one another about the moon's motions, in the London *Mechanics' Magazine*, *Engineer*, &c., to come to *terms* at once upon this question—let them explain what they understand about the moon's motions, and no longer make fools of themselves by cultivating misunderstanding about what they mean.

Lord Palmerston and the Manchester Mechanics.

On a recent visit to Manchester the present Premier of Great Britain, on invitation, delivered a lecture before the Mechanics' Institute of that city, in their New Hall. The following are some extracts from it, and they are worthy of being written in letters of gold.

"We are assembled in a building which, in its splendor is worthy either of an emperor of the present day, or of one of those great commercial States, which in the earlier periods of history, played so powerful and prominent a part in the affairs of the world. There are two remarkable circumstances peculiarly distinctive of the times in which we live—the principle of co-operation for common objects, and the general diffusion of knowledge. In former times there were many men eminent in all the branches of human learning, but, as regards the great masses of mankind, the avenues of knowledge were, to a certain degree, closed; but the arrangements of later periods, which are improving from day to day, tend to diffuse among the great mass of the community, or, at all events, among all who are willing to receive instruction, the results of the labors of science and the fruits of the investigations of the learned. The intellectual qualities, as well as the moral feelings of our nature are scattered broadcast over the face of the earth. We find them everywhere, in the lowest classes as in the highest. Their development depends on the opportunities which are offered for their culture.

In this country the road to wealth and to honors is open to all. Some of those among us, who have filled the most distinguished situations have sprung from the humblest position, and have raised themselves by their talent and good conduct. The great merit of these institutions is, that whereas the laboring classes are unable, by their own unaided exertions to obtain access to those means of instruction which are necessary for the development of their intellects, and whereas their hours of leisure are so few as to afford them but little opportunity for mental culture, you open to them the whole range of the treasure of science, and, whatever line their genius may be best adapted to follow, you furnish them with the means of cultivating their faculties and thus increase their knowledge, and, through their knowledge, their happiness.

The poet hath said,

"A little learning is a dangerous thing,
Drink deep or taste not the Pierian spring."

But I hold that that is a mistake, and much error has it produced. A little knowledge is better than no knowledge at all. The more knowledge a man has the better, but if his time and the means at his disposal do not permit of his acquiring deep and accurate knowledge, let him have as much as he can, and, depend upon it, he will be all the better for it, and, although he may not be able to drink deeply of that spring, if his lips have once tasted of it, he will go back to the same delicious waters whenever he has an opportunity, and his draughts, be they great or small, will refresh his fancy, invigorate his intellect, raise him in the scale of civilization, contribute to his individual happiness, and make him a more useful and honorable member of society.

Then we may be told that we will make him a mere smatterer in knowledge, to which I reply that it is better for a man to be a smatterer than to be ignorant and uninstructed. I may be asked whether I would make him an astronomer, or expect him to calculate eclipses, describe the orbits of comets, or examine the course of the planets. By no means; but of all sciences the mechanism of the universe is that of which a man who has little leisure at his disposal may most easily obtain an insight by the knowledge of those facts which are the result of deep study and careful calculation. An ignorant man believes that his country is the only one in the world, that this planet is the only great portion of creation, that the sun is placed in the firmament merely to warm him, the moon to light him home, and the stars to amuse him on the journey, but when he is led into the secrets of that vast universe, the contemplation of which fills the mind with awe, his views become liberal and enlightened, his mind is raised above the ordinary groveling ideas of life, and he finds himself a superior being to what he had been before. It is clear, therefore, that institutions which promote such desirable objects are eminently deserving of the support of the nation. They tend to bring together the different classes of society, combining them in the bonds of good fellowship, allaying their jealousies, mitigating their asperities, and causing them to work together in harmonious action for the general benefit of the commonwealth."

The Value of Scientific Men.

The Philadelphia *Ledger* of the 29th ult. contains an exceedingly able article on the above subject. The following extracts from it will give our readers much pleasure:—

"To many, the scientific men of a nation seem but drones, without practical utility, trying all sorts of impracticable experiments in their laboratories, mixing acids and alkalies and talking learnedly on subjects far removed from practical life, but *doing* nothing for mankind. Solomon tells us too of a poor wise man who delivered a city, yet no man remembered him.

If there is one sign of these times more hopeful than another, it is that scientific men are, as a class more honored than at any former period of the world's history. James Watt, who discovered the steam engine, has enabled England, with a population of twenty-five millions, to do work that as many hundred millions of men could not have done without. It is thus that science has created the fabulous wealth of that monarchy. She is doing the same at this moment for our own country. Who can tell the value to this nation of the life of such a man? Fulton, with his steamboats, or even above him, our own glorious old Franklin, who wrested the lightning from heaven, and the sword from the hands of tyrants? Doubtless many a man, who boasted of his own great practical business powers, smiled, if in passing he marked him, with kite and key demonstrating, in this, our own city, the identity of lightning and electricity, and laying the foundation thus for those electrical telegraphs now ready to convey tidings from continent to continent round the globe in an instant. Who can calculate the value of such a man as Prof. Morse to the country and to the world?

The scientific man, then, is of value to the community just in proportion to the amount of labor he saves to other men while producing similar results. Leibig has increased the production of all the farms in England, by applying the principles of analytic chemistry to soils, manures, and agricultural results generally—he has been worth millions of bushels of wheat already to Europe. The scientific medical men of that country have lengthened the average of life several years. The same is true of mental science. He who has a better knowledge of those laws which enable a man at once to distinguish truth from error, can write a book which will save thousands from some popular mistake, or from years of laborious thought, enabling men to form just conclusions without delay. His empire is over the mind of man.

Nor is science less valuable even in matters of religion. Moral science is but a branch of this. M. Guizot, in Paris, is at this moment urging the establishment of a faculty of scientific theology in that city. Natural religion is, of all sciences, the most delightful, the most practical, and the most useful. It corrects a thousand political blunders, and is, in effect, the basis of all true legislation."

Industrial Progress of our Country.

The display of industrial activity in the United States almost exceeds the capacity to grasp it. Mr. De Bow, in his compendium of the census, gives the value of the agricultural productions of the United States, in 1850, as $1,320,691,326, and states that in 1854 it had increased to $1,600,000,000. The total tunnage of the United States in 1855 was 5,212,000, of which 2,535,136 tuns consisted of seagoing vessels. The internal commerce of the country in 1852 was,

Coasting trade .	$3,319,439,372.
Canal commerce .	1,188,000,000.
Railway commerce .	1,081,500,000.

The products of manufactures and mechanics for 1856, it is estimated, will approach the value of $1,500,000,000, and the products of the seas, including fisheries, freights, transportation, etc., $1,200,000,000. In addition to the immense capital invested in commerce and manufactures, there is either improved or under actual cultivation, 113,032,614 acres of land. Within the last twenty-five years nearly $800,000,000 have been invested in railroads alone, and corresponding sums have been expended in other forms of internal improvements—ordinary roads, canals, improving the channels of rivers, harbors, &c.

Oak Acorns in Bread.

A French chemist takes acorns, hulls them, and then boils them in a weak solution of carbonate of soda for about half an hour then taken out and washed. This operation removes the astringent taste from them; after which they are dried and ground up into flour. Mixed with an aqual quantity of wheat flour, it is said to make a palatable and nutritious bread.

Removing Indelible Ink Stains.

To remove spots of nitrate of silver indelible ink, moisten them for a few moments with moist chloride of lime, which forms chloride of silver, and then dissolve the latter by caustic ammonia. It may be sometimes necessary to repeat the operation. Cyanide of potassium may also be employe.

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New Inventions.

Boardman's Coal Burning Locomotive.

This locomotive, on which we made a trip and gave an account of its performance on page 394, last Volume, has ever since been employed by the New Jersey Railroad Transportation Co., and a recent report of its performances has been presented by Mr. Van Rensselaer, an old Superintendent of the road. He has tested its capacity in every possible way, states that it has thus far proved completely successful under the most trying circumstances, and a great improvement over the wood-burning engines, both in convenience and economy. Assuming the cost of the coal to be $6 per tun, (Cumberland coal being used.) he estimates the average expense of running it at about ten cents per mile, or a saving of from 35 to 50 per cent. in fuel, over the wood-burning engines—the running speed being at the rate of nearly 45 miles an hour. It runs from Jersey City to New Brunswick, (31 1-2 miles,) in one hour and five to ten minutes, including stops at the stations, &c. The cost of running the most economical wood engine on the same road, Mr. Van Rensselaer estimates to be a fraction less than 14 cents per mile, which he considers below the average cost.

Hot Bleaching Liquor.

We have received a letter from a correspondent, in which he states that some bleaching liquor, heated by mistake to 120°, to bleach linen, produced no bleaching effect whatever, and he wishes to know the reason. The agent which produces the bleaching effect in the common liquor, is chlorine, which is absorbed by water from chloride of lime, when mixed with it, and the clear solution is the common bleaching liquor employed in paper mills, calico print-works and bleach-works. It is a volatile gas, and is therefore driven off easily with heat. All the chlorine was driven off in our correspondent's vats by the heat, consequently we have a solution of the question, "why his liquor did not bleach his linen?" Chlorine liquor will bleach more rapidly when hot than cold, but the only way to use it properly, is to pour in cold strong bleaching liquor into hot water, then handle the goods rapidly in this—for the heat long continued will drive off all the chlorine.

Improvement in Sewing Machines.

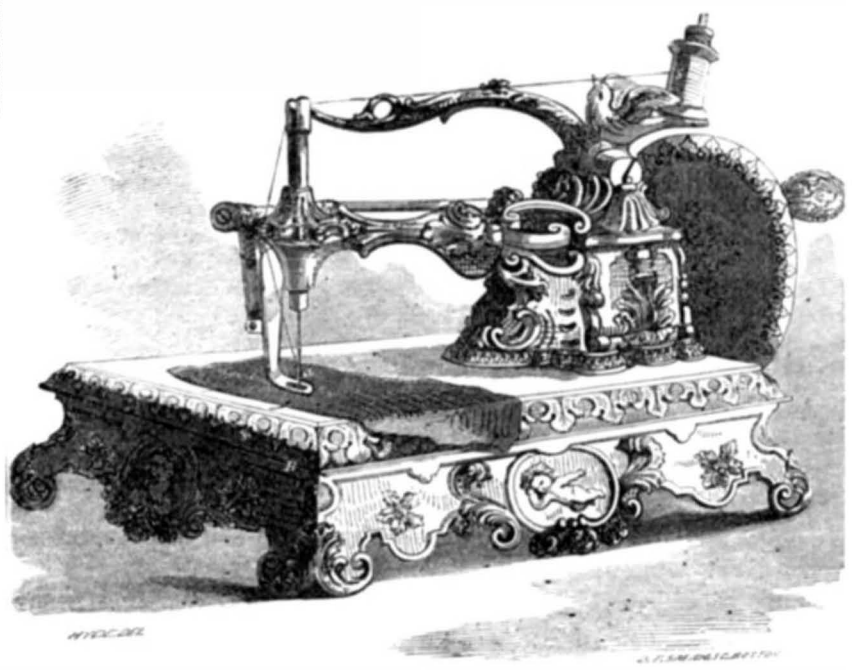
The accompanying engraving illustrate the cheap Sewing Machine to which we alluded in the last number of the Scientific American. at the end of its patent claim, page 98.

Figure 1 is a perspective view, and fig. 2 is a plan view, showing the under side. Similar letters refer to like parts.

The working parts are mounted on and secured in a neat cast metal tablet, B. The spool, S, supplies thread passing through a guide eye in the needle arm, thence down through the eye of needle *a*, near its point, from whence it is carried through the cloth and made to operate in a peculiar manner to form a twisted loop stitch. The working parts are shown in fig. 2. A is a cam cylinder secured on the spindle of the driving pulley, or handle, and secured in the hollow standard on the tablet; *g* is a cam groove in it to operate the needle arm by a pin on the arm inside, inserted in the groove; it also operates the cloth bar or feeder, by the pin, C, in the groove; this pin is attached to a rocking arm, and gives the cloth feeder a reciprocating motion in unison with the stitches of the needle. The under side of this feeder is serrated. The pin, C, can be adjusted to feed the cloth for fine or coarse stitches. The cam cylinder causes two stitches to be made at each revolution. On the end of the cylinder, A, are two cam projections, D, which vibrate arm E, projecting downwards, and which is connected by an axis pin, F, to a horizontal walking-beam arm, G, secured in the bottom of the tablet by a pin, O, passing through a small strip, P. A coiled spring, *q*, is attached to a pin in arm G. The arm, G, operates the looping hook, M, which causes the chain stitch to be made; it is therefore secured to a small tube, H, which has a spiral groove, *h*, in it. The hook, M, is secured to a small piston, I, in the tube; there is coiled spring on the shank of the hook piston to throw it back when relieved of pressure. There is also a small pin secured on the hook piston, which pin is inserted in the spiral groove, *h*. J is a projecting guide plate for the needle, *a*; it has a ledge with a small vertical groove in it for the needle. K is a projection on the bottom—inside of the tablet.

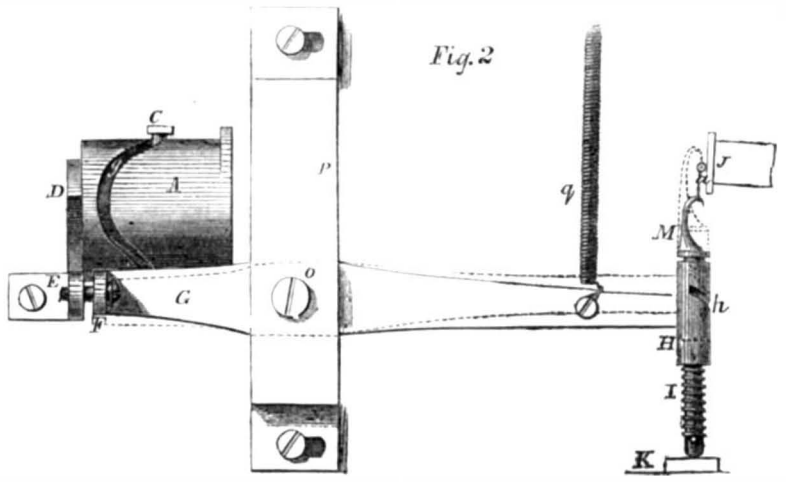
The hook, M, is shown hooked into the loop of the thread. As the cam cylinder, A, is revolved, and the end of arm G, carrying the

WATSON'S FAMILY SEWING MACHINE.



hook tube, is moved towards the projection, K, the hook, M, carries the thread back with it in the form of a loop, and when the shank I, is pressed against the projection, K, the pin of the hook in tube H, is carried in groove, *h*, which thus gives the hook a twist, and with it the loop of the thread. When the arm, G, ceases to be pressed against K, by its cam having passed over its upper ends, E, the hook, M, by the coiled spring, is drawn back into its former position, allowing the thread to pass off its point, to be carried up by the needle arm, and drawn tight in tothe stitch. All the motions are performed conjointly with one another, that of the needle, the cloth feeder, and hook, M, to produce a twisted chain stitch with a single thread. The parts of this machine are few in number, and are arranged with great simplicity.

The proprietors of the patent state that one of their objects is to furnish machines of this character—8 inches by 5—for families, at a retail price of $10. A sewing machine operating correctly, and not liable to get out of



order, furnished for this sum, must be a boon to the public. This machine operates much better than some elaborately constructed and far more expensive single thread machines we have examined. Due notice will be given in the Scientific American when machines are to be retailed in this city.

For further information address (by letter only) Goodell & Prall, sole agents for Watson & Wooster, No. 1 Cortlandt street, New York.

Improvement in Locomotives.

J. R. Whitgrave, of Rugely, England, has recently secured a patent for peculiar improvements in locomotives. He places the steam cylinders midway between two pairs of driving wheels, which are so disposed as to bear nearly the whole weight of the engine, and a third pair of wheels are added, as leading or traveling wheels to complete the six required for the safety of the engine; another pair of leading wheels may also be added. The cylinders are placed horizontally, and are fitted with the ordinary valves and gearing, and are worked in the usual way, but instead of having the piston passing out at one end of the cylinder only, it is carried through both ends of it, which are fitted with stuffing boxes. The piston is thus prevented from causing undue friction on the under side, and also from wearing untrue.

Connecting rods are attached to both ends of the piston rod of one cylinder, the one connecting rod communicating with one of the cranks on the leading driving wheel axle, and the other with one crank of the rear driving wheel axle; both of these cranks are acted on simultaneously by one cylinder and piston, and caused to revolve in the same direction. The opposite cylinder is similarly fitted and furnished. The connecting rods of the one cylinder communicate with cranks on the leading and rear driving axles, which cranks are placed at right angles to the other cranks on their respective shafts, in order that both engines may not be at the same time on the dead point. By thus arranging the cylinders and pistons to act in opposite directions at the same time, the tendency to oscillation is avoided, and collectively, a greater amount of power exerted on the driving wheel axles, and the revolving force of one wheel being communicated to the other through the piston rod, which wheels have an increased hold or bite on the rail from the whole weight being brought to bear on them, or nearly so, without risk to the running of the engine.

Another of the improvements in locomotive engines refers to the method of connecting the tender thereto, and consists in forming the end of the tender convex, and presenting the section of a cylinder or circle with a vertical axis. The end of the engine is concave to suit the curved end of the tender. The engine and tender are connected by a draw bar suitably attached to the engine, and jointed at the point or center from which the curve of the junction is struck, from which joint to the rear draw hook the draw bar is continued, and slides in suitable bearings. The tender is held close up to the engine while running. The joint pin of the draw bar may or may not be fixed to the tender. Thus the engine and tender are made as one body, the one steadying the other, and preventing any side motion, and giving a clear floor and secure footing to the engineer.

Improved Tools.

We have examined a number of specimens of tools made by George Parr, Buffalo, N. Y., consisting of shoemakers' and saddlers' awls, tinsmiths' punches, cold chisels, oyster knives, screw-drivers, Yankee screw-drivers with hollow handles, and a set of tools within; scratch awls, pinking irons, etc. They exhibit an excellence of finish and superiority of quality highly creditable to the maker. It is but a short time since all articles of this kind were imported. But now they are extensively manufactured here. Mr. Parr employs about fifty men besides a variety of the most improved labor-saving machinery, for the production of tools of the above character. His heavy forging is done by one of Hughes' steam trip-hammers; and for turning the handles he uses Blanchard's celebrated lathe. Mr Parr's establishment is a model one in its arrangements, and the tools having his stamp are unsurpassed.

Use of the Syphon at the Mines.

In the new diggings discovered on the San Andreas Gulch is a shaft sunk sixty-seven feet, which is drained by a syphon. The lead pipe which conducts the water extends several hundred feet down to the gulch. The only difficulty is in regulating the syphon, so as to exhaust the water no faster than the supply comes into the shaft. This difficulty once obviated, and the syphon will be introduced in numerous mining claims on our hill-sides, where the ledge has never yet been struck, and the labor consequently lost. Hundreds of rich mining shafts, now abandoned on account of the water, may yet be successfully worked by aid of the syphon. In every instance where a shaft has been sunk to the ledge in all the new claims just below Jenk's ranch, rich prospects have rewarded the enterprise. Parties are at work sinking shafts in Jenk's field.—[San Andreas (Cal.) Independent.

[The above is certainly incorrect. A syphon will not drain a mine over thirty feet deep. Its action is due to the pressure of the atmosphere, which can support a column of water only 30 feet high at the level of the sea. Miners of California should not be deceived regarding the use of the syphon in draining mines; it never can be of much benefit to them for this purpose; they must trust to the lifting pump as the most sure and certain means for keeping their mines free from water.

The sum of $105,000 will be applied this year for agricultural purposes by the Commissioner of Patents. This is the amount appropriated at the last session of Congress

Aluminum is now manufactured on a large scale at Rouen, France.

SPLENDID PRIZES.—PAID IN CASH.

The Proprietors of the Scientific American will pay, in *Cash*, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit

For the largest List,	$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st of January, 1857.

☞ See Prospectus on last page.

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Scientific American.

NEW YORK, DECEMBER, 13, 1856.

The Uses of Scientific Literature.

The applications of science to the arts of life are such as but a few years ago would have been contemplated with amazement, and even incredulity. How has this been accomplished? By the steady pursuit of such knowledge, by study and experiment, and by literature, which hands down the discoveries and improvements made by the sons of toil and genius.

Literature fosters science, by treasuring up and transmitting all the knowledge which has been acquired in times past, so that it can be rendered subservient, by its application to the arts in every succeeding age.

This may truly be said to be the extent of the usefulness of scientific history as published in books. Periodical scientific literature is more useful; it may justly claim to be very nearly related to progressive science itself, and of near kindred to discoverers and inventors. Science consists in the clearly explained and well arranged discoveries of men of genius and research. Every new invention extends the boundaries of science; is a contribution to the treasury of knowledge, and a step onward in the progress of civilization. How are discoveries and inventions made? Many persons suppose they are the offspring of lucky rambling thoughts, which, like the music of the wandering winds, come and go unbidden, and these they call "strokes of genius." If such views were correct, inventors would have little to be proud of; if such opinions are true, the esteem in which the memory of men of genius is held, is entirely misplaced. But such views are not correct, nor are such opinions true. Many valuable discoveries and inventions have been made suddenly, such as the law of gravitation, and the steam engine, but they were not the results of rambling thoughts; their authors had their minds ardently fixed upon the subjects of their inventions when they made them. Had this not been the case, their names would never have been handed down to us covered with well-earned honors. Inventions, discoveries, and improvements are made by the attention of men of genius—those who can plan—being directed to particular subjects. Were their minds not so directed, science would be stunted in its growth, and genius would bring forth but few fruits for the benefit of man. What is the great agent for directing the thoughts of the sons of genius to useful subjects? Periodical scientific literature. It fixes the minds of reflective and observing persons on particular questions; it sharpens their intellect, and the rasults are the evolution of numerous inventions and discoveries, and an extension of the boundaries of science.

There are thousands of men in our country who have original powers of mind—inventive faculties of a high order—that are lying unproductive for want of being prompted by periodical scientific literature. Were they brought within its influence they would soon develope many new inventions to benefit themselves and others.

The extract from the Report of the Secretary of the Interior on another column shows that the spirit of improvement is active in our country. Useful inventions have wonderfully increased in number within the past few years. We have carefully watched the rapid progress of improvement, and have noticed that it has been running in parallel lines with our increased circulation, thus affording peasing testimony to the great usefulness of scientific periodical literature.

Prospects of Cheaper Ocean Postage.

A proposition has been received by our government from that of Great Britain, to reduce the postage between our country from 24 to 12 cents for single letters. Our Government has indicated a willingness to agree to this proposal, provided England reduces the transit charge on mails passing through that country to 12 1-2 cents per ounce—the price paid for the conveyance of the Canada mails through the United States. The British Government, if it is wise, will accede to this proposition, which is a fair one in every respect. There are some prospects, we think, of obtaining cheaper ocean postage, which will be of great advantage to the people of both sides of the Atlantic, in promoting their social and business intercourse.

The Patent Office.—Secretary of the Interior's Report.

The Secretary of the Interior, in whose Department the Patent Office is classed, has given some useful information in his Report, respecting its affairs, and as this part of it is not very long, we publish it entire, accompanied with a few remarks.

"Since the 1st day of January last the Patent Office has issued 2,255 patents, and within the year the number will probably be increased to some 2,500.

All applications are promptly attended to; and it is hoped the interests of that meritorious class of our people, the inventors, are properly secured and protected. None are more worthy the fostering care of the General Government.

From small beginnings the Patent Office has grown into proportions comparatively gigantic. Half a century ago, the whole revenue of the Office did not exceed $1,500 per annum, which was appropriated to the payment of one clerk, who transacted the entire business of the Office. The income for the present year will be about $200,000, which will still be scarcely sufficient to defray the current expenses of the Office, with its one hundred examiners, clerks, and other employees.

If we compare the present condition of the Office with what it was a few years ago, we shall find that during the four years previous to 1853, the average annual number of applications for patents was 2,522: while for the four subsequent years such average will be about 4,000. The number of patents annually issued during the former period, average 990, during the latter about 1,850. For the current year, the whole number of applications made, the whole number of patents granted, and the amount of revenue received, will, respectively, be at least double what they were in any previous year. The number of applications for patents in this Office, the last year, was greater than that in any other country, having been 4,435, against 2,958 in Great Britain, and 4,056 in France. For the present year the number of applications will probably reach 5000.

The business of the Office seems to have outgrown the system upon which it has thus far been conducted, which was adapted to a previous stage of its existence. The wisdom of Congress may be profitably exercised in making such modifications as present circumstances require."

We like the spirit in which this Report appears to be dictated, and the sympathy which appears to be manifested in it for inventors, but we wish the Secretary of the Interior had been more explicit in regard to the action which he wishes Congress to take upon the present condition and management of the Patent Office. The idea conveyed to our mind by the immediate preceding sentence of the Report, is, that the present system upon which the Patent Office is conducted, is bad—that it is not adapted to its present wants, and that it should be entirely changed. He suggests that "the wisdom of Congress may be profitably exercised in making such modifications as its present circumstances require." This is a proper recommendation and it will require great wisdom to deal with it. We hope the Secretary does not mean to recommend the passage of the absurd Bill for the Reforming of the Patent Laws, which was before the Senate last winter. It exhibited but a very small amount of wisdom on the part of those who framed it. If it were to become a law, the business of the Patent Office would soon become almost extinct; a deep injury would be inflicted upon our inventors, and the progress of our country's improvements in the useful arts would be greatly retarded. It would be unwise to attempt a *radical* reform of the Patent Laws; the present *system* does not require to be revolutionized, it merely requires an extension of the present means for effectually carrying it out, so that the business may be performed promptly, and in that liberal spirit embraced in the law now provided for its management.

The recent rapid growth of the business of the Patent Office, is positive testimony in favor of the views we take of this question. We hope the Secretary only means in the changes recommended, that the Commissioner of Patents be relieved of considerable extra labor, which he has now to perform, relating to matters not immediately connected with patent business, and that ample means be provided without an increase of patent fees, for the prompt, generous, just, and efficient transaction of business between the Patent Office and inventors.

We claim this as an act of justice to inventors, and one of statesman-like policy, for the benefit of our country. There can be no doubt but inventors have done more to develope the resources and increase the material greatness of our country than any other class of men. What would be the condition of our agriculture, commerce, and manufactures, without the cotton gin, improved plow, power looms, spinning jennies, planing machines, locomotives, railroads, steamboats, telegraphs, &c. Why, no one will question the statement that "without these inventions, our country would never have arisen to its present greatness." Every means for encouraging inventors, therefore, tends to advance the interests of our country, and some of those means are cheap patent fees, and a simple and efficient system of securing patents. According to the Report there were 4,435 applications for patents, in 1855, in the United States; 4,056 in France, and 2,958 in England. These figures show that the number of patents applied for in any country, is according to the patent fees charged—the greatest number where the fees are lowest—America; and the least where they are highest—England. The greatest number of useful inventions are therefore annually brought into public use, in that country which has the lowest patent fees, namely the United States.

We are happy to be able to pay a tribute of praise to one part of this Report in reference to the Patent Office Building. When completed it says, it will "temporarily accommodate all the bureaus of his department; but this should not deter Congress from making the necessary appropriations for a *Departmental Building*, which will be much needed before, under ordinary circumstances, it can be constructed and prepared for occupancy. No valid reason can be assigned for further delay." We have censured the Secretary for attempting to alienate the Patent Office Building from the legitimate purposes for which it was intended—namely, entire consecration to patent business. He now recommends that appropriations should at once be made for a new building exclusively devoted to the business of his Department, thus leaving the Patent Office building to be devoted to it appropriate objects exclusively.

This recommendation in his Report will afford our inventors sincere pleasure,

Preserving Sail Cloth and Awnings.

In the patent of Sir William Burnet, which we described two weeks ago, in giving an account of the method of preserving timber at Lowell, Mass., the application of the chloride of zinc is set forth as being as effectual in preserving textile fabrics as in preserving timber. As a knowledge of this fact is of importance to those who manufacture and use sail cloth and awnings, or any textile fabric exposed to the weather, we will describe the method of applying it.

A tank or tub is filled nearly full of the solution, formed of one pound of the chloride of zinc to every five gallons of cold water. In this the cloth is immersed, and kept under the liquor, somewhat loose, for about ten days. It is then lifted, dripped, and hung up in a shed or sheltered place until it is quite dry, when it is fit for use. Care must be exercised that there be no free acid in the solution; the chloride must be in the form of a dry salt. The cloth, before it is immersed in the solution, must be carefully wet in every part, by steeping it for a short time previously in hot water.

This method of treating canvas, it is stated, prevents it from mildewing and rapid decay. Rope and cordage treated in the same manner also endure much longer; but they require to be steeped in the solution longer than cloth, because they are so much thicker.

Children's Aid Society.

This Society is doing a noble work in this city. Its object is to take children—boys and girls—who have lost their parents or have none to care for them, and find good homes for them in the country, principally in the West, among the farmers. It has now been in existence for about four years, and has sent out yearly from 800 to 1000 children, in the manner described, many of them being picked up from the streets and rescued from the haunts of vice.

By thus providing homes for these outcast children, there is every prospect of their growing up to be useful to those who take charge of them, to themselves, and to the community. The society has no complex organization, and no large institution to maintain at a great expense, but it does a great deal of good with little means. The citizens of New York ought to encourage it liberally, because while it does good to these children, it prevents them from becoming vagabonds and pests to society. The rooms of the society are in Clinton Hall, Astor Place. C. C. Tracy, Agent. Money and clothing is solicited, to carry on the good work undertaken by this Society.

Our Prizes for the New Year.

We beg to remind the active portions of our friends, that New Year's Day is close at hand, when our much talked-of Cash Prizes are to be awarded. Who will send us in the largest list of subscribers, and so take the first prize Who the second? And who the remaining twelve? We answer, those who exercise the greatest activity during the few days now remaining until January 1, 1857. We hope that none of the competitors in this worthy strife will forget the story of the race between the turtle and the hare.

Grenades for Home Defence.

Capt. Norton, formerly of Cork, Ireland, but now residing in England, whose railroad explosive signals were illustrated in Vol. 10, Scientific American, has invented a simple contrivance for causing an alarm in case of an attempted burglary. It consists of a small tube about three inches long, charged with an explosive substance; at each end is affixed a string with a loop, one loop being fastened to a nail in the door post, and the other to the door itself; consequently when the door or shutter is forced, an explosion takes place, and the inmates are alarmed. Or it may be thrown from an upper story into the street, causing a report sufficiently loud to rouse the neighbors. Specimens have been placed at the London Polytechnic Institution, the Crystal Palace, and at the United Service Museum, to prove that the invention can be effectually used.

The Atlantic Ocean Telegraph.

The latest news from England, brings the gratifying intelligence that arrangements have been made to construct the Ocean Telergraph Line from Newfoundland to Ireland.

The British Government has, at the request of Cyrus W. Field, Esq., of this city, ordered a steamer to be fitted out under efficient officers, to examine thoroughly the coasts of Ireland and Newfoundland, and to sound across the Atlantic between these parts to ascertain the best place for laying and landing the Submarine Telegraph Cable. The Government has further agreed to guarantee four per cent. interest on the whole capital required to manufacture and lay down the cable between Newfoundland and Ireland. Contracts for the whole extent of the Atlantic cable were signed in London on Tuesday, the 19th November.—one half to be manufactured by Messrs. W. Kuper Glass & Co., of London, and the other by R. S. Nowell & Co., of Liverpool. It is all to be completed and placed on board of two steamers, ready for sea, on or before the 31st of May next, and by the 4th of July next, it is confidently expected that Great Britain and the United States will be in telegraphic communication.

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The Strength of Solid and Hollow Brick.

Experiments have lately been made in England to test the relative strength of the above named kinds of brick, by Messrs. Horner & Molesworth, Civil Engineers, and the results of these experiments have been published in the *Journal of the Society of Arts.*

The experiments were made with a 9-inch hydraulic press; the plunger by which the pressure was applied was 1 inch in diameter, and the weight was suspended to a lever, which multiplied the power 15 times. In applying the transverse strains, however, a shorter lever, which only multiplied the power by 5 was used. The bricks subjected to a crushing force were faced, so as to remove all inequalities; they were then bedded on a sheet of thin lead, and another sheet placed upon them.

The pressure was communicated by a cast-iron plate, so arranged as to adjust itself to the brick, and distribute the pressure uniformly over the whole surface. The weights were carefully applied, and allowed to come to a full bearing before more were added.

In exposing the bricks to a transverse strain, the supports were placed two inches apart, and the weight gradually applied to the center by means of a spring balance.

The solid brick made by machinery were the strongest. A solid brick of 8 lbs. weight, made by a machine, withstood a crushing weight of 117 tuns, while a hollow brick weighing 6 lbs. only withstood a crushing weight of 47 tuns. A solid brick made by hand, weighing 5 3-4 lbs. withstood only a crushing weight of 13 tuns.

When exposed to a transverse strain, hollow bricks weighing 6 lbs. only withstood a breaking weight of 3 tuns, while solid brick weighing 8 3-4 lbs. required 9 tuns weight to break them. Solid bricks made by hand, weighing 9 1-2 lbs. were broken by a weight of 4 1-2 tuns.

In these experiments one fact appears remarkable, namely the great strength of machine-made brick in comparison with those made by hand, according to their weight.—Thus a machine-made solid brick weighing 8 3-4 lbs. withstood a transverse strain up to 9 tuns 17 cwt., while a hand made solid brick of 9 1-2 lbs. was broken with 4 tuns 8 cwt. Hollow and perforated machine-made brick were much stronger than the solid hand made brick, although weaker than solid machine brick. In molding brick by machinery the pressure exercised on the clay is much greater than can be by hand; the particles of the clay and sand are, therefore, brought into closer contact, and their cohesive powers thereby greatly increased by the intimate connection of all the particles.

These experiments are of great value, and afford evidence of some of the benefits conferred upon the arts by machinery, in comparison with hand labor. Brick machines do away with one of the most laborious human drudgeries, and at the same time produce a superior manufacture.

The New Steam Frigates.

The Secretary of the Navy has the following in his Report, respecting the five new steam frigates:—

"In my last annual report I informed you that three of the steam frigates ordered by Congress were afloat. It now affords me pleasure to state that they are all afloat. The machinery for each will be complete and ready for trial in a few days. The *Merrimac* and *Wabash* are now in commission. Thus far the most sanguine expectations of the Department have been fully realized.

The performance of the *Merrimac* has impressed favorably the severest architectural critics. The machinery and boilers have exhibited remarkable evidence of power; the material and workmanship were superintended and approved by the engineers of the government, although built, of necessity, in private establishments. The speed is greater than usual in auxiliary steamers, in which steam is by no means the chief motive power, but the great desideratum is attained of preserving unimpaired all the essential elements and capacity of the sailing vessel.

Five of these frigates were modeled by the Chief of the Bureau of Construction, &c., and will each carry a battery of 8-inch. guns on the spar deck, 9-inch. on the gun deck, with a 10-inch. pivot gun bow and stern.

The *Niagara*, built in New York, was modeled and completed in the Navy Yard by the late George Steers, whose genius and great capacity for shipbuilding were so highly commended that he was appointed temporary Naval Constructor for that purpose. She will carry the novel armament of 12 11-inch guns, each throwing a shell of 135 pounds.

The introduction of these magnificent vessels constitute an era in the history of the United States Navy, and while they may well stimulate the energy and valor of its officers, they will also excite emotions of a just national pride in the bosom of every American beholder."

[The opinion of the Secretary of the Navy respecting the *Merrimac* must be taken with a wide margin. The Editor of the *United States Nautical Magazine* in this city has criticized it with severity, and its performance has been the very reverse of impressing him favorably.

The boilers have not operated satisfactorily, or else one of them would not have had a hundred tubes taken out while in this port, before leaving for England—her speed is also rated low. On the whole, however, she is a noble vessel, and has astonished Uncle John Bull, across the water.

Progress of American Manufactures.

The following extract from the Report of the Secretary of the Treasury will show the rapid progress made, and the extent of our manufactures at present:—

"In 1790 but little manufacturing was done in the country, as a distinct business. Nearly all that was done was in private families for domestic use. Now manufacturing is a separate pursuit, and immense capital is employed in its various branches. In 1840, the value of our manufactures was returned in the census of that year, at $483,278,215, and in 1850 they were returned in the census of that year at $1,055,595,899. The ratio of increase makes our manufactures for 1855 $1,391,031,293. In this result we recognize the fact that we have become a great manufacturing people, and the tables accompanying this report prove we are likewise a great agricultural and commercial people. An impulse, in accordance with the national sentiment, was given to manufacturing, by the imposition of duties on imports in our first revenue laws, and the impulse was increased from time to time by the imposition of additional duties. At first we manufactured the coarser and more bulky articles required by our population; gradually we have extended our operations to a great variety of articles, and to some requiring much skill in the execution, and now our manufactures are in possession of our home market in a great variety of articles. In 1790, our planters raised no cotton for exportation; now it is the great crop of our planting states, and they furnish it as a raw material to the manufacturing states, as well as to foreign nations, and now we manufacture the coarser cotton goods for the consumption of our entire population, and export near $7,000,000 annually to foreign countries. Our manufacture of cotton in 1840, was $46,360,453, in 1850, $61,869,184, and the same ratio of increase in 1855 would give $70,961,712."

Minerals of Connecticut.

The Rochester (N. Y.) *Democrat* says:—"Our townsman, Mr. John Alling, has just returned from a visit to Middletown, Conn. He brings with him specimens of the ore taken from the lead mines at that place, discovered and opened a few years since by a French gentleman. The quartz bears a large per centage of lead, mingled with silver and copper. Some portions are quite rich with silver; one small lump, weighing two pounds and nine ounces, which Mr. Alling brings, is said to be half silver ore. This mine is within a few rods of the Connecticut river, and the shaft extends 280 feet below the surface, and 160 below the bed of the river. It is stated that the yield is about 2300 tuns of crushed or separated ore per month. It is sent to Philadelphia for smelting. Near this mine is an old one, worked years ago, and now again opened. New England is full of mineral treasures which an agricultural and manufacturing population have but indifferently developed."

[The quantity of ore said to be obtained from this mine must be a mistake, as it amounts to 27,600 tuns per annum. There is not a copper or lead mine in our country which produces this amount of *separated* ore annually.

Manufacturing Ice.

A few weeks since we called for information from E. T. Sterling, respecting the cost of manufacturing ice, as practiced at the Cuyahoga Works, Cleveland, Ohio, stating at the same that if it could be produced at a cost not exceeding five dollars per tun it would be hailed as a useful invention by those residing in our Southern States, and in other warm regions. The following is information furnished us on the subject:—

"The machine in its present state, is arranged for making a tun of ice at an operation. A square cistern with a double wall has the space between the two walls, about one foot, filled with pulverized charcoal; inside of the inner wall are six rows, each row containing twelve cast-iron freezers, each capable of holding as much water as will make 30 pounds of ice; each freezer has a depth of twelve inches and the length is the same as the depth, and the width is six inches. A flange or rim of half an inch extends around the four sides of the freezer, and upon this the freezer is suspended by restives or bars running at right angles. The flanges thus arrayed, separate the freezers, forming a channel between each of one inch width. A passage of equal width extends under the bottom.

A steam engine works an air pump connected with a vessel containing ether, and as soon as a perfect vacuum is produced the ether is pumped from this vessel around the cistern containing the water, and returned into the vacuum vessel, and the heat extracted, and thus the operation is continued until the water is frozen into ice. This is the whole process of refrigeration.

The machinery is peculiar to save the ether from wasting in the exhausted air. The items of expense are the steam power; it takes two cords of wood to run a ten tun machine, one engineer to attend it, and two firemen.

2 cords of wood at $5 . . .	$10·00,
1 engineer, per day, . . .	3·00,
2 firemen, $1·50 per day, .	3·00.
	$16·00.

By allowing $10 for contingent expenses, the whole working expense amounts to $26 per day in producing ten tuns of ice ready to be carted away. As to the ability of the machinery producing this amount I think there is no difficulty, and it is no more liable to get out of order than a common steam engine.

Mr. Merriam, of Brooklyn, who saw the machine in operation, believes it would be applicable to produce entire cold in the holds of infected vessels, and thus destroy yellow fever virus. This can be done, and a current of air as cold as 24° below zero circulated through the hold of a vessel. E. T. Sterling.

Cleveland, Ohio, 1856.

A Railroad Joke.

The London (C. W.) *Free Press* gives currency to a joke which is said to be going the rounds of the railway circles, to the following effect:—

"A Michigan gentleman owned several shares in American railways, which he desired to sell in London, but was unable to find a purchaser. He finally offered them to the English Board of Directors of the Great Western Railroad Company, who agreed to take £80,000 of the stock, if the other party would accept in exchange the steamers *Canada* and *America*, which had already proved a dead loss of £20,000 to the Company. Michigan agreed to the trade, on condition that the steamboats should be delivered in Lake Erie. This was consented to, and a written contract made and signed. Now it happens that the steamboats thus transferred are too long to pass through the Welland Canal locks, and the question arises, how is the contract to be fulfilled? It is safe to conjecture that the Englishmen have been taken in."

Sounding the Ocean.

The following extracts from the Report of the Secretary of the Navy is the first official document issued respecting the survey of the Atlantic Ocean between Newfoundland and Ireland, by the *Arctic*, for the purpose of discovering a practicable route to lay a submarine cable. The account of the performance of the *Arctic* is brief but interesting.

Alluding to Lieut. Maury, it says:—

"He had been so bold as to insist that whenever a survey could be made of the bottom of the ocean, between Newfoundland and Ireland, it would be ascertained that such were the moderate depths—such the perfect repose there, and absence of abrading or disturbing currents, that telegraphic wires could be laid as safely and successfully as upon land."

"Lieutenant Brooke, of the Navy, had invented a most ingenious, yet simple contrivance, by which the moment it touched the bed of the ocean, it became detached, and carefully took up specimens of whatever it came in contact with, and brought them up safely to the operator.

There was an act passed, in 1849, giving authority to the Secretary of the Navy to use national vessels for 'testing new routes, and perfecting the discoveries made by Lieutenant Maury in the course of his investigations of the winds and currents of the ocean.' I confess I felt some pride in having the science and naval genius of our own country to continue foremost in these great ocean surveys, and in illustrating the practicability of so grand a conception as harnessing the lightning and making it obedient beneath the profound depths of the great sea, which Providence has placed between the old and the new world. Lieutenant Berryman, accompanied by Lieut. Strain, Passed Midshipmen Mitchell and Thomas, Midshipman Barnes, and a few men, left New York on the 18th of July, crossed the ocean, and returned on the 14th of October, bringing with him abundant supplies of curious and interesting specimens from the bed of the ocean, and at the same time beautiful charts, mapping out its various depths, at distances of thirty, forty, sixty, and one hundred miles. In order to make his soundings approximate accuracy, as nearly as possible, Lieut. Berryman returned in the same latitude and re-examined points where he had doubts The length of the route surved is about 1600 miles; the greatest depth found was 2,070 fathoms (about 2 1-2 miles,) the average, however, being much less. These charts and specimens have been turned over to the Naval Observatory. The Superintendent has already caused the specimens to be analyzed, and in the hands of a learned professor, whose report is before me, they are made to tell much of the character and mysteries of that ocean covered region. He thinks the appearance of the minerals 'indicate that they have been quietly deposited from gentle currents, and not subsequently disturbed.'

It is affirmed now that the developments of this survey corroborate the suggestions of scientific investigators, and establish the practicability of laying wires successfully on the bed of the sea."

The Compass on Iron Ships.

Dr. Scoresby, of England, celebrated for his scientific attainments, recently undertook a voyage to Australia, for the purpose of making experiments with compasses on iron vessels, in order, if possible, to discover some means of preventing local attraction. In writing from Australia after accomplishing his voyage out, he says: "The only way to keep the compasses from being influenced by the iron of the vessel is to elevate it above the reach of its influence on the mast." He also says: "If the return voyage shall prove as satisfactory as the one out, the principal risk in the navigation of iron ships may be considered overcome."

The St. Louis papers state that the steamer *Amazon*, belonging to that city, has been furnished with a steam organ, like that of the *Glen Cove*, running on the Hudson river.

Cement for Steam Pipes.

2 parts of litharge, 1 of sand, and one of lime, mixed with linseed oil, makes a cement or steam pipes.

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J. F. B. of Mich.—The machine patented by William Wood, of Westport, Conn., is capable of riving out shingles at the most rapid rate. How many it can cut per hour we are not able to say.

N. K. of Ohio—We are not engaged in the sale of patents. Our professional engagements will not allow us to undertake this branch of business.

Wm. E. McBride, of Independence, Mo, wishes to purchase a shingle machine capable of riving and shaving oak and walnut shingles.

N. A. Messenger, of Tuscumbia, Ala., wishes to correspond with some one who can furnish him with a machine for cutting out lath.

C. C., of V. C.—There are not many iron foundries engaged in casting chilled rolls. It is a difficult operation to perform with success. Some of the best we have ever seen were cast at the Iron Foundry, Birmingham, Ct., Sheldon Bassett, agent.

J. C. D. & B., of Mich.—There is no work published on the kinds of ornamental steel and bronze work, to which you refer.

A. M. G., of N. Y.—How is the spiral path of a lima bean climbing up a pole towards the skies either east, west, north, or south? You certainly have mistaken the clear meaning of the entire sentence to which you refer.

A. C., of ——.—The diagram which you have sent of two large wheels running on rails, also a small wheel on the same shaft, running on an elevated rail, exhibits a bad arrangement. The small wheel will cause great friction, because it must slide on its rail.

C. H. M., of Ohio.—If you can furnish us with the weight of your car and its friction, we can tell you the amount of power required to move it with a velocity of two miles per minute.

C. C. H., of N. Y.—A locomotive can be made to run faster than a pigeon can fly.

C. J. W., Ohio.—If you boil cotton in a strong solution of alum, and then dry it thoroughly, it will be rendered incombustible.

G. W. N., of M. T.—A perfect vacuum cannot be obtained in any air pump. A pump containing six cubic feet, and running at the rate of 200 strokes per minute, will discharge 12,000 gallons of air per minute. A 1-horse power engine should be able to work it.

F. S., of Conn.—Camphene will dissolve india rubber. It must be kept warm in a tight vessel, and stirred frequently for some days. The number containing the articles on coloring mats cannot be obtained.

X. C., of N. Y.—Your caustic lye is better than a lye of soda ash for bleaching purposes. You should boil the goods at least two hours.

E. C. L., of N. Y.—During the Exhibition of the World's Industry, in New York City, in 1851, Dunn, of England, exhibited a model of a substitute for a turntable, precisely like yours. He was surprised, after all his trouble, to find that the same thing had been actually used in this country at least ten years. It is a well-known invention.

Messrs. Warren & Sons, Wheeling, Va., desire to correspond with some one who manufactures the best known apparatus for molding candles. They want something more expeditious than the method now most commonly used.

W. F. F., of Geo.—We could not conveniently furnish the information you wish in regard to the wool hat business. We do not know of any sewing machine capable of stitching heavy leather brogans. The boot-pegging machine to which you refer appears to be a good one, but as to its success in a practical point of view we are not able to say. By addressing the parties referred to, ou may learn all the facts in regard to it.

I. S., of Mass.—Ure's Dictionary of the Arts describes methods of making various varnishes.

H. P. of Iowa.—The heads of a cylinder boiler are most liable to give way. A boiler constructed of large plates is stronger than one made of small plates. Rivetting does not add to the strength of a boiler.

G. L. B., of N. C.—It would require a long letter and a sketch to explain the method of obtaining silver from its ore. In Vol. 11 on page 145, you will find an account of the process. There are some ores much richer than others.

G. McH., of N. Y.—If you have invented a method of walking under water like a frog or fish carrying a submarine lamp, using no bell or supply pump, your invention is worth millions of dollars.

J. C., of Pa.—If the coal in your county is good for manufacturing oil you will soon be able to find a market for it.

I. T. of N. Y.—Sawdust is injurious to the salmon spawn. The increase of saw mills on the creek you mention, is, no doubt, one reason for the departure of the salmon.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Dec. 6, 1856:—

A. H. of N. Y., $30; J. J. L. of Pa., $25; J. H. T. of N. J., $30; S. E. P. of Tenn., $25; D. & M. of Cal., $10; S. G, T. of O., $30 J. F. B. of Pa., $50; A P. G. of Mo., $15; A. M. C. of N. Y., $30; R. R of Pa, $30; R. & R. of Pa., $30; J. H. of N. Y., $30; S. D. T. of N. Y., $35; J. H. K. of N. Y., $30; J. F. M. of Pa., $30; N. R. of Pa. $25; W. F. of Mass., $25; H. H. of N. Y., $55; M. P. of N. Y., $30; S. B. D. of N. Y., $32; J. C. of L. I., $20; A. W. L. of Mass., $20; S. H. W. of O., $30; G. F. S. W. of S. C., $25; K. & L. of Mich., $30; C. S. F. of Kansas, $55; A. F. W. of Ky., $58; E. Q. S. of O., $55; J. F. N. of N. C., $25; H. H. S. of N. Y., $25; D. P. & Co. of N. Y., $25; H. A. H. of N. Y., $30; P. E. of Ala., $15; J. G. G. of N. Y., $20; J. G, H. of N. J., $32; S. E. I. of N. J., $25 J. R. of N. Y., $10; V. B. R. of N. Y., $10; C. H. of N. Y., $40.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 6:—

E. G. H. of N. J.; S. E. P. of Tenn.; J. J. L. of Pa.; G. E. H. sf N. Y.; A. M of N. Y.; G. F. S. W. of S. C.; N. R. of Pa.; W. F. of Mass.; E. F. F. of Vt.; S. E. J. of N. J.; J. R. of N. Y.; V. B. R. of N. Y., W. F. F. of Ill; S. B. D. of N. Y.; J. F. N. of N. C.; T. J. M. of Ga.

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Subscribers to the Scientific American who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

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Science and Art.

Gum Benzoin.

This gum is said to be the produce of the *Styraz Benzoin*, a lofty tree, which grows in Siam, Sumatra, and Java, but, according to some accounts, it would seem to be also obtained from a smaller tree, cultivated in Borneo. The best balsam is obtained in Siam by incisions made in the trunk of the tree after it has attained the age of five or six years. The resin is white and transparent at first. About three pounds are given by each tree for about six years. It forms an article of export from Siam. Benzoin is the frankincense of the far east, and has long been used for incenses in the Roman Catholic, the Hindoo, Mahomedan, and Budhistic temples, and probably in the Israelitish worship. Wealthy Chinese fumigate their houses with its grateful odor. Olibanum, which is cheaper, is in similar and more general use in other parts of the East Indies.

To Make Siemen's Artificial Stone.

Take 100 lbs. of caustic soda in solution evaporated to 80 quarts, and 1 lb. silica added for every quart. The solution is effected under a pressure of 4–5 atmospheres in a strong steam vessel. This solution, mixed with quartz sand, hardens to a stone which strikes fire with steel. For building stone, millstones, &c., 1 pint of the solution is mixed with two volumes of fine silica, and to the whole are added 10 parts of sand of different degrees of fineness, and sometimes 5 parts of coarse sand or gravel in addition. When the stones are air-dried, they are kept for several days in an apartment heated to 104°. They become quite hard in five or six days.

Improvement in Uncoupling Cars.

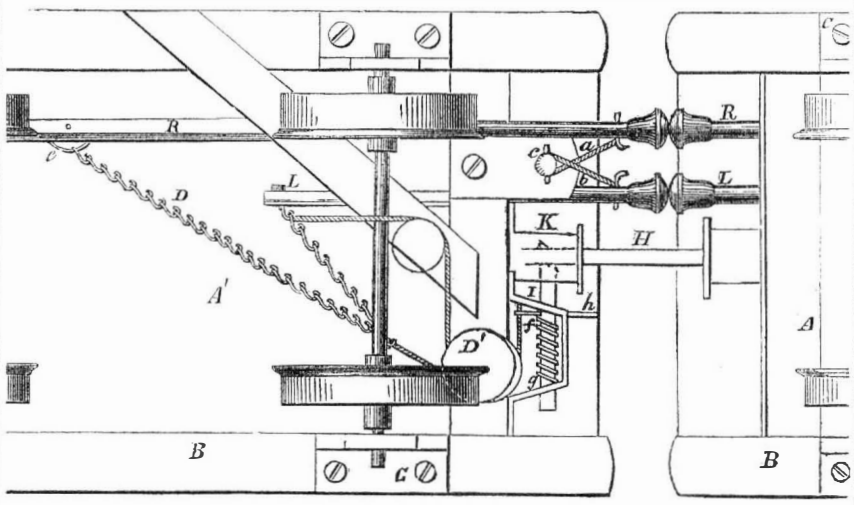
The loss of life and the destruction of much property caused in many railroad accidents might have been prevented if suitable means for detaching one car from another, when in rapid motion had been provided.

Railroad accidents arise from various causes; some by the breaking of wheels, by the engine being thrown from the track, by coming in contact with cattle or other obstructions, then dragging the train after it, rendering the whole one vast wreck With proper facilities attached to the cars, they could be instantly detached from the tender, and pass along the road without further accident, unless the obstruction when struck by the engine were only partially removed, in which case it would be again struck by the forward car, which, in all likelihood, would also be thrown from the track. To provide for such contingencies, every succeeding car should be instantaneously detached, in succession, so as to give some one of them a chance to be saved from destruction. It is, therefore, of vital importance that the couplings of every car should be made capable of being simultaneously detached.—To provide such means is the object of this invention, which consists in so arranging and supporting a rod under, and running lengthwise of each car, that the hinder end of every one shall, when operated, strike against the forward end of the rod in the succeeding car, causing it to withdraw the bolt that connects the cars together. By this means the engineer may, in the event of danger, uncouple every car in the train from each other, thus presenting a chance to some, if not to all the cars, to pass along the road uninjured, should the engine happen to be thrown from the track, the same effect being produced upon all the cars in the rear of any particular one which happens to be operated upon in that manner.

The accompanying figure is a plan view of the invention, showing the under side of a tender and car. A represents the tender, and A′ a car, connected together by means of the improved coupling; B is the frame-work of each, to the side beams of which are secured the bearings, C, in which the wheels are mounted.

Through mortises in the cross beams of the frame of each car there are passed a series of rods, R, in a line with each other, commencing with one extending from about midway of the engine backwards, until its rear end rests against the forward end of the one attached to the tender, A, which runs along under its whole length until its rear end rests against the forward end of the one secured to the car, A, and that in turn to the rod on the next car, and so on to the end of the train, there being one attached to every car. To the side and near the forward end of the rods, R, are secured a cord or chain, *a*, to each, by means of a staple or eye bolt, the other end of which is attached to a staple, also secured to the lower end of the crank shaft, *c*, the latter being supported in bearings secured to the underside of the cross beam of the frame. On the upper end of the shaft is mounted a lever or crank wheel, by the turning of which the chain, *a*, is wound upon its shaft, causing the rods, R, to move in a direction towards the rear of the cars. Towards the rear end, and

BUMPER ARRANGEMENT FOR UNCOUPLING RAILROAD CARS.



near the middle of the rods, R, on their inner side are secured eye bolts or hooks, *e*, to which are connected one end of the chains, D, the other passing round a pulley, D′, and secured to one end of a pin, *f*, on the side of the spring bolt, I, the latter passing through a mortise in the coupling box, K, and connecting link, H, and by which the cars are coupled to each other. Around one end of the bolt, I, is wound or coiled a spiral spring, *g*, having its bearing respectively against the side of the bracket, J, that supports and guides the bolt and pin, *f*, for the purpose of projecting the bolt, I, to couple the cars when the retreating force is removed, and also causing the rods to assume the proper position to be again acted upon to withdraw the bolt. The pin, *f*, is caused to pass clear through the bolt, I, and also through a mortise or slot in the front side of the bracket, J, to form a handle, *h*, by which the bolt may be withdrawn when the cars are stationary.

If the crank, E, of the engine be turned so as to wind up the chain, *a*, it will cause the butt end of the rod, R, to strike against the head of the corresponding rod of the tender, both of which are enlarged for this purpose. It, in turn, as it is pressed back, strikes against the rod, R, of the car, pushing it before it, and dragging with it in its retrograde movement chain, D, to which the spring bolt, I, is secured, withdrawing the latter from the mortise in the connecting rod, H, thus detaching the car, A′, from the tender, A.

The rod, R, of the car, A′, will also, when pressed back as described, strike the head of the rod in a line with it in the succeeding car, causing it to detach that car in the same manner as that of car A′, and so on through the whole train of cars, having the whole detached from one another. Other means are provided for uncoupling any desired number of cars without detaching them from each other, as in cases of emergency.

Through mortises in the cross beams of the frame, B, and parallel with the rods, R, are passed rods, L, the mortises serving to support and guide the heads or ends of the rods against each other. To the forward end of these rods is connected a chain, *i*, in a similar manner to the chains of the rods, R, the other end of the chains being attached to the end of the crank shaft, *c*, like those of the chains, *a*. At the rear end of the rod, L, of the car, A′, and which is so made as not to extend throughout the whole length of the car, is attached one end of a cord or chain, D, the other being attached to the chain of the bolt, I; or, instead of being directly attached to the latter it may be first passed round a sheave, *n*, so that when the chain, *i*, is wound upon the shaft, *c*, by the crank or lever wheel of the car, A′, the rod will be drawn backwards, dragging the chain, D, to which the spring bolt is connected, as described, along with it, in this way withdrawing the bolt from the coupling bar. H, thus detaching the car from the tender without uncoupling those in the rear, as would have been the case had the rod, L, of each car extended throughout their whole length. Each car, being provided with this apparatus, will enable the conductor to detach any number of cars from the train.

As it is desirable that the engineer should be able to separate the engine and tender from the cars without being under the necessity of going to the car, or waiting for the conductor or brakeman; therefore, to effect this, the rod, L, of the tender is extended throughout its whole length, so as to bear against the corresponding rod of the car, A′, whereby, by turning the crank of the engine so as to wind up the chain, *b*, the rod, L, of the tender will, when struck by that of the engine, be made to bear against the corresponding rod of the car, A′, pushing its backwards, whereby the bolt, I, is withdrawn from the connecting bar, H, and the car detached from the tender.

Through the ends of the rods, R and L, of the engine, are passed pins, to prevent them from moving beyond a certain distance, there being others for the same purpose through both ends of the remaining rods, R and L, on the inner side of the cross beams.

For further information address the inventor, William O. George, Richmond, Va. Patented Oct. 7th, 1856.

The Still-Room.

Time was, when in the *still-room* "distilled waters" and "cordials" were drawn and dispensed as specifics for maladies to guests and dependants, but now this practice is out of use, because they can be purchased cheaper than they can be made at home; nevertheless the *still-room maid* preserves her name, though rarely required to perform her ancient duties. To expect the revival of this part of domestic economy would be absurd, yet we must say that a domestic laboratory attached to the conservatory would prove highly instructive and amusing. To those even, who have no conservatory, we would yet advise to set a room apart in their mansions, with the title of "laboratory," or the ancient one of "still-room." Here experiments may be made, scents distilled, and an acquaintance courted with "common things," without interfering with other people of the establishment, or "making a mess about the house." The amount of instruction that can be derived from a private laboratory, is far more than at first sight can be conceived, and the entertainment, changeable as a kaleidoscope, is intellectually considered immeasurably superior either to crochet or Berlin work. The delicate manipulations of chemical experiments is well, even better, suited to their physical powers than to the sterner sex, and to the ladies, therefore, we commend the charge of becoming the *chefs* of the modern still-room.—[Piesse's Art of Perfumery.

The Origin of the Tape Worm.

This worm, for the fishing of which from the human stomach we published an illustrated description in Vol. 10 Scientific American, is described in the Paris *Gazette Medicale*, to have its origin as follows:—"The Hebrews are never troubled with it; the pork butchers are peculiarly liable to it. and dogs that are fed on pork are universally so afflicted; in fact, it turns out that a small parasite worm, called *crystecersas* (from two words signifying a small sect and a tail, which much affects pork,) no sooner reaches the stomach than, from the change of diet and position, it is metamorphosed into the well known tapeworm; and experiments upon a condemned criminal, have established the fact beyond all contradiction."

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